Quarterly Report – Public Page

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Prepared for: **U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration**
Project Title: **Improvements to the External Corrosion Direct Assessment (ECDA) Process (WP#360): Severity Rankings of ECDA Indirect Inspection Indications**
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During this reporting period, an empirical model is being developed that would enable accurate and consistent severity ranking**:**

- The plan is to develop an empirical correlation of above-ground indirect inspection indications with the corresponding corrosion state of the anomalies discovered through direct examination of buried pipelines

- The next step is to use the empirical correlation in predicting the corrosion state of an anomaly on a buried pipeline based on the signals from above-ground indirect inspection tools

Based on the requirements of NACE RP0502, two indirect inspections techniques are required to be used at grade to identify and define coating faults, other anomalies, and areas at which corrosion activity may have occurred or may be occurring. An empirical relation for prioritizing indications for possible digs is represented by a weighting factor for two above-ground indirect inspection techniques, namely: Close Interval Survey (CIS) and Direct Current Voltage Gradient survey (DCVG). A simple additive relation is **W=3A + 2B**. Where A represents a range of values for minor, moderate, and severe indications for CIS data and B represents a similar set of values for DCVG data.

After corrosion discovery through direct examination digs, corroded pipe remediation actions are normally prioritized as follows: Immediate Action Required, Scheduled Action Required, and Suitable for monitoring. To develop a wholesome empirical model, a corresponding set of empirical criteria are developed for the three possible remediation actions. The three criteria are expressed in terms of Safety Factor (SF) as follows: **SF ≤ 1.1** (Immediate Action Required);1.1 **≤ SF ≤ 1.39** Scheduled Action Required; and **1.39 ≤ SF for** "Monitored" Remediation.

Data from a variety of sources will be used to develop an empirical correlation of the values of W1, W2, and W3 with the values of SF1, SF2, or SF3 depending on whether the ECDA indirect inspection indication is "minor", "moderate", or "severe". The resulting relationships will be tested against actual field data